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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: PHOSPHADIDYLINOSITOL 3,5-BIPHOSPHATE INHIBITORS AS ANTI-VIRAL AGENTS

(57) Abstract: Phosphatidylinositol 3,5-biphosphate signaling has been found to be critical to the process of viral sorting, trafficking and viral budding from mammalian cells. Inhibitors of the phosphatidylinositol 3,5-biphosphate pathway therefore have activity as anti-viral agents.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K31/00 A61K31/4178 A61K31/437 A61K31/42 A61K31/421
 A61K31/422 A61K31/426 A61P1/16 A61P7/02 A61P9/00
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BIOSIS, CHEM ABS Data, EMBASE, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 18744 A (HATTORI KOUJI ; KONO YUTAKA (JP); NAKAZATO SHOKO (JP); TANAKA AKIRA (J) 6 April 2000 (2000-04-06) * p.25, 1.4 from the bottom; claims 7-15 *	1-3,6-11
P,X	WO 02 32900 A (HASHIZUME YOSHINOBU ; OKUMURA YOSHIYUKI (JP); SHINJYO KATSUHIRO (JP);) 25 April 2002 (2002-04-25) cited in the application * p.1, 1st par.; claims 10-14 ; p.5, 1.3 *	1,3,4,6, 8-12
P,X	WO 02 50033 A (GIBLIN GERARD MARTIN PAUL ; ROOMANS SUSAN (GB); GLAXO GROUP LTD (GB);) 27 June 2002 (2002-06-27) * p.9, 1.4; claims 1-16 *	1-3,6-11
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/16760 A (KOHNO YUTAKA ; NAKAZATO SHOKO (JP); TENDA YOSHIYUKI (JP); FUJISAWA PHA) 30 March 2000 (2000-03-30) cited in the application claims 1-11 -----	13
X	US 5 972 965 A (TABUCHI SEIICHIRO ET AL) 26 October 1999 (1999-10-26) * p.1, 1.34-p.2, 1.5; claim 5 * -----	1-3, 5-11,13

INTERNATIONAL SEARCH REPORT

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-3(part.),4,6-11(part.),12 and 13; 1st
3rd and 8th subject matters identified in PCT form 210 searched
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210-----
Continuation of Box I.2

Present claims 1-3,4 and 6-12 relate to a the use of compound (i) for the treatment of a disease (ii) wherein both the compounds (i) and/or the disease (ii) are defined by reference to a desirable characteristic or property, namely.

(i) an EP4 receptor ligand

(ii) an IL-6 involved disease

The claims cover all compounds (i) or diseases (ii) having this characteristic or property, whereas the application provides support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC for only a very limited number of such compounds (i) or diseases (ii). In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 84 EPC). An attempt is made to define the compounds (i) or diseases (ii) by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the compounds (i) of formulae (I) and (II) and to the diseases of claim 2 as well as the terms as such for both (i) and (ii). Regarding the functional definition, EP4 receptor ligand, it might well be the case that compounds already known for treating diseases listed in claim 2 were not identified so far as EP4 ligand.

Regarding Formula (II), the term "heterocyclic group" in R1 (claim 5 or 13) is an open ended definition which render the entire formula (II) unclear and leads, in fact, to an overflow. Therefore, this definition for R1 has been disregarded

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6, 8, 10-13 (1-6, 10-13 in part)

Use of fused heteroaryl derivatives of formula I(a) as inhibitors of the phosphatidylinositol 3-phosphate 5-kinase and/or the phosphatidylinositol 3-kinase for the manufacture of a medicament for use as an antiviral agent

2. Claims: 1-6, 10-13 (all in part)

Use of fused heteroaryl derivatives of formula I(b) as inhibitors of the phosphatidylinositol 3-phosphate 5-kinase and/or the phosphatidylinositol 3-kinase for the manufacture of a medicament for use as an antiviral agent

3. Claims: 1-5, 7, 9-13 (1-5, 10-13 in part)

Use of fused heteroaryl derivatives of formula II as inhibitors of the phosphatidylinositol 3-phosphate 5-kinase and/or the phosphatidylinositol 3-kinase for the manufacture of a medicament for use as an antiviral agent

INTERNATIONAL SEARCH REPORT

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